

Claims

1. An electromagnetic drive device comprising a drive
10 part arranged to be reciprocated in the stroke direction and
possessing a circular or oval cross section, said drive part
having a permanent magnet arrangement magnetized athwart the
stroke direction, such arrangement possessing at least one
pair of oppositely magnetized magnet portions arranged
15 sequentially in the stroke direction and being arranged in
the intermediate space of a yoke arrangement with pole
pieces provided in the direction of magnetization on
opposite sides of the drive part, characterized in that the
yoke arrangement (16) possesses two pairs of pole pieces (19
20 through 22) delimiting the intermediate space and which are
joined together by two yoke regions (23 and 24) extending
essentially in parallelism to the stroke direction (H), at
least one of the yoke regions (23 and 24) being surrounded
25 by a coil (25 and 26) able to conduct current for performing
a stroke and each pair of pole pieces (19 and 21 and
respectively 22 and 22) is provided with a pair of
oppositely magnetized magnet portions (11, 12; 32, 33 and,

respectively, 13, 14; 34, 35) of the permanent magnet arrangement.

2. The electromagnetic drive device as set forth in
5 claim 1, characterized in that in the non-energized state of
the at least one coil (25 and 26) each pair of oppositely
magnetized magnet portions (11, 12; 32, 33 and,
respectively, 13, 14; 34, 35) is positioned in the vicinity
of two pole pieces (19, 21 and, respectively, 20, 22)
10 arranged on either side of the drive part (10).

3. The electromagnetic drive device as set forth in
claim 1 or claim 2, characterized in that the pairs of
magnet portions (11, 12; 32, 33 and, respectively, 13, 14;
15 34, 35) are spaced apart by an intermediate piece (15; 36)
in the stroke direction (H).

4. The electromagnetic drive device as set forth in
claim 3, characterized in that the intermediate piece (15;
20 36) comprises non-magnetizable material.

5. The electromagnetic drive device as set forth in any
one of the preceding claims, characterized in that the width
of the pole pieces (19 through 22) and/or the diameter of
25 the at least one coil (25 and 26) is essentially equal to
the diameter of the drive part (10; 30).

6. The electromagnetic drive device as set forth in any one of the preceding claims, characterized in that the drive part (30) comprises a tube (31) or round rod of non-magnetizable material, more especially plastic, which bears 5 the magnet portions (32 through 35).

7. The electromagnetic drive device as set forth in claim 6, characterized in that each magnet portion (32 through 35) comprises two oppositely magnetized semi-10 circular disks or half rings (32a through 35a, 32b through 35b).

8. The electromagnetic drive device as set forth in claim 7, characterized in that the magnet portions (32 through 35) are arranged in pits or recesses in the tube 15 (31) or round rod.

9. The electromagnetic drive device as set forth in any one of the preceding claims, characterized in that the drive 20 part (10; 30) is connected with an output drive part, which preferably is designed in the form of a piston of a piston spool valve or some other valve member.

10. The electromagnetic drive device as set forth in 25 claim 9, characterized in that the drive part (30) designed in the form of a tube (31) provided with the permanent magnet arrangement (32 through 35) is in the form of a

gripper tongs connected with the output drive part.

11. The electromagnetic drive device as set forth in
any one of the preceding claims, characterized in that
5 several yoke arrangements (16) are arranged in tandem in the
stroke direction (H).